THE AMERICAN RADIO RELAY LEAGUE, INC.
INTERNATIONAL SECRETARIAT OF THE INTERNATIONAL AMATEUR RADIO UNION
ADMINISTRATIVE HEADQUARTERS NEWINGTON, CONNECTICUT, U.S.A. 06111

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OFFICIAL JOURNAL

No. 87-1
Copies sent to all
Digital Committee members
Date: June 22, 1987

AD HOC COMMITTEE ON AMATEUR RADIO DIGITAL COMMUNICATION

Gentlemen:

On the recommendation of Eric Scace, I am numbering all Digital Committee documents starting with this mailing.

The committee's report to the July Board Meeting (Doc. #23) (87-2) is enclosed.

No. 87-3 is a letter from Paul Newland, AD7I, with his recommended language to update the FCC rules to recognize CCIR Recs 476 and 625. As Paul's wording is consistent with the committee's discussion at our May 23-24 meeting, I will ask the Executive Committee to consider petitioning the FCC to that effect.

No. 87-4 is a complete copy of the application for the STA to permit unattended HF packet operation as filled with the FCC. Because the FCC had not yet processed the request, we were able to slip in several more letters of participation at the last minute, as late as last week. If you hear from others who want to tag on, the gate is now closed as the FCC does not like to keep adding stragglers.

I keep running across magazine articles of interest to the committee. Also, several committee members have been sending me similar material (principally Phil Karn, KA9Q, sends me everything ever written saying TCP/IP is alive and everything else is a disease). While it's considered OK to make a photocopy of magazine articles for your own use, it's against postal regulations to send photocopied copyright material through the mail without consent of the publisher. I still think it desirable to bring some items to your attention so you can scrounge your own copies if desired. Some current ones follow:

Phil noted an item on p 82 of the LOCALNetter newsletter, Vol 7, No. 5, May 1987, entitled "TCP/IP is dead - or is it." The article says that NBS thinks TCP/IP is dead but points out that IBM has been delivering TCP/IP implementations in Europe for some time.

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The June 1987 issue of Data Communications on p 15 has an interesting item saying that the Corporation for Open Systems (COS) -- a US consortium to accelerate implementation of OSI products -- has implemented TCP/IP for their in-house network, with slightly red face. As COS explained it, they couldn't implement any OSI protocols because they haven't certified any, so they'll use TCP/IP in the interim.

Page 22 of the June 1987 issue of IEEE Communications Magazine has a thoughtful article on "Cellular Access Digital Network (CADN): Wireless Access to Networks of the Future," by E.S.K. Chien, et al.

73,

Paul L. Rinaldo, W4RI
Chairman

No. 87-2
Copies sent to all
Digital Committee member
Date: 6/22/87

Doc. #23

REPORT OF THE AD HOC COMMITTEE ON AMATEUR RADIO DIGITAL COMMUNICATION

1. The Digital Committee met on May 23, 1987 at ARRL HQ.

2. At the top of the agenda were packet frequencies in response to Board Minutes 45(a) and 45(h) of the 1986 Annual Meeting and Minute 80 of the 1987 Annual Meeting. The committee's recommendations are contained in Annex A to Doc. #23, which has been forwarded to the Chairman of the Membership Services Committee.

3. Minutes 68 and 74 of the 1987 Annual Meeting charged the committee with studying message handling via packet radio. A working group has been appointed with a view toward providing recommendations to the Board at its 1988 Annual Meeting.

4. The application for a special temporary authority for automatic unattended operation of HF stations was filed with the FCC on June 3, 1987. There was a flurry of activity for several weeks prior to that to work out last-minute details. The understanding and support of members of the Executive Committee is appreciated.

5. Networking and transport protocols are making excellent progress, with four entries at last count. The On Line column in May, 1987 QST gives a summary of the four approaches. The committee' plan of action is to encourage public exposure of these protocols at the Sixth Amateur Radio Computer Networking Conference to be held on August 29, 1987 in Redondo Beach, CA, also to encourage further field trials. At the appropriate time when trials results are compiled, the committee will consider standards.

6. Suggestions continue to be received concerning possible enhancements to version 2.0 of the AX.25 link-layer protocol. A working group has been appointed to study (a) desirable short-term fixes leading to a version 2.1, and (b) long-term developments that would necessitate a version 3.0. A possible long-term change making the call-sign fields extensible. The problem is that reciprocal calls with suffixes such as FH1/WB3XYZ/T will not fit in the fixed, six-character fields.

7. The impact of AMSAT Phase 4 (geostationary) satellites on the packet network was discussed. It was agreed that development should be focused on 2.048 megabit-per-second TNCs and modems for earth-to-satellite packet, as the appetite for data-handling capacity will grow enormously in the five or more years it will take to build Phase 4.

8. There have been numerous modem developments since the January 1987 Board Meeting. TAPR has completed design of a 1200-bit/s PSK modem for use with Fuji Oscar 12. The Hamilton (ON) Amateur Packet Radio group has completed a 4800 modem that works through the audio section of voice transceivers. GLB Electronics and AEA announced their 9600/19200 bit/s RF 220-MHz modems, and the ARRL lab is progressing with a spectrally conservative 9600-bit/s GMSK modem for 220 MHz. Perhaps the most exciting development was the 56-kbit/s RF modem developed by Dale Heatherington, WA4DSY, in association with the Georgia Radio Amateur Packet Enthusiasts (GRAPES). The problem is that the modem can send packets faster than available TNCs can generate them.

9. The committee reviewed correspondence relating to AMTOR specifications as well as a draft specification written by Peter Martinez, G3PLX, and will recommend that the Executive Committee authorize a petition to the FCC to recognize new CCIR Recommendations 476-4 and 625.

10. The committee established a working group on an optimal link-layer protocol for HF packet radio. Early emphasis will be on testing and data collection.

11. A draft specification for the interface between modems and SSB radios written by Paul Newland, AD7I, was reviewed by the committee. The plan is to raise the idea with the Japan Amateur Radio Industry Association (JAIA).

Respectfully submitted,

Paul L. Rinaldo, W4RI
Chairman

No. 87-3
Copies sent to all
Digital Committee members
Date: 6/22/87

RECEIVED
1987 JUN 16 AM 10:48

Post Office Box 205
Holmdel, NJ 07733
201-671-8107 [R]
201-834-1149 [B]
June 11, 1987

Mr. Paul Rinaldo, W4RI
Chairman, ARRL Ad Hoc Committee
on Digital Communications
American Radio Relay League
225 Main Street
Newington, CT 06111

Dear Paul:

Thanks for your letter of April 8th. Sorry I was unable to respond until now. Your mailing included two CCIR documents of interest to amateur radio. The first was CCIR 476-4 (AMTOR) which is simply an update of CCIR 476-3. I would suggest that the ARRL petition the FCC to allow the use of this mode in addition to 476-2 and 476-3.

The second was CCIR 625 which provides a moderate upgrade to the SITOR/AMTOR protocol to allow a slave station to determine who has called it. Also, the number of identification signals was increased to seven to allow for additional unique SELCALLs. I would also recommend that the ARRL petition the FCC to allow the use of this code as well.

CCIR 625 can intercommunicate with CCIR 476-2,3,4; the only limitation is that the 625 station must call the 476 station by using 4 character SELCALLs instead of the 7 character SELCALLs allowed by 625 (there is provision for this in CCIR 625). Also, CCIR 476 stations can call a 625 station if the 625 station has been programmed to accept calls to a 4 character SELCALL. Forward Error Correcting mode (FEC -- Collective Mode B) remains the same except that the 625 signal sends more "end of transmission" symbols to ensure that the receiving equipment has shut down; this doesn't cause any incompatibility between 476 and 625. Selective Forward Error Correcting mode (SELFEC -- Selective Mode B) differs between 625 and 476 in that the 625 station can transmit either a 4 or 7 character SELCALL.

I would recommend that the ARRL petition the FCC to have §97.69(b)(3) read as follows:

> "(3) The International Radio Consultative Committee (CCIR) Recommendations 476 and 625 (commonly known as AMTOR); provided that the code, baud rate and emission timing shall conform to the specifications of CCIR 476-2 (1978), CCIR 476-3 (1982), CCIR 476-4 (1986) or CCIR 625 (1986), as appropriate".

This wording removes the redundancies by the double use of the revisions plus the reference to Mode A and Mode B, which restricts nothing (hence there is no reason to specify Mode A or Mode B). It also includes CCIR 625 as an AMTOR protocol (as it should be).

Regarding the choice of SELCALL for CCIR 625, which uses a 7 character alpha string instead of the 4 character string for CCIR 476, I recommend that radio amateurs use the

procedure listed below. It has the advantage that call signs can be mapped to 7 character alpha call signals without the aid of a programmable calculator or written tables.

Let the Call Identity signals be refered to as K1 through K7 where K1 is the first call identity signal transmitted and is the first call identity signal entered into equipment and where K7 is the last call identity signal transmitted and is the last call identity signal entered into equipment. Next consider an alpha-numeric call sign of length N (N can be 1 to infinity). If the call sign contains a SSID (-0, -1, -15) convert this to a single letter by the following conversion: -0 to null, -1 to K, ..., -15 to Y. Convert any remaining numbers within the call sign to letters using the following conversions: 0 to A, 1 to B, ..., 9 to J. Lable each character of the resultant call sign, from left to right, as C1, C2, C3, ..., until all characters of the call sign have been assigned a Cn identifier. For all Cn from n=2 to n=7, if Cn is unassigned, it assumes the value of C(n-1). Finally, for value values of n from 1 to 7, let Kn = Cn. The result is a string K of length 7 containing only alpha characters and will be used as the seven signal call identity.

For example, consider the call sign W1AW-8. First convert the SSID to an alpha character (-8 becomes R) resulting in W1AWR. Next, convert any remaining numbers to alpha characters (1 becomes B) resulting in WBAWR. Finally, if the length is more the seven, drop anything after the seventh character (in this case nothing to drop). If the length is less then seven, pad the end with the last character until the length is seven. For our example, this becomes WBAWRRR.

For KB2QTZ-15 the 7 signal call identity would be KBCQTZY. For 9V1QZ-3 the 7 signal call identity would be JVBQZMM.

Please kick this method around and see if there are better alternatives. I like this system because is can be reconstructed from memory fairly easily.

Sincerely,

Paul Newland, ad7i

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No. 87-4
Copies sent to all
Digital Committee members
Date: 6/22/87

June 2, 1987

Mr. Michael T. N. Fitch, Chief
Private Radio Bureau
Federal Communications Commission
Washington, DC 20554

Dear Mr. Fitch:

In re: STA for Unattended HF Packet Operation

The American Radio Relay League (the nonprofit, educational and scientific organization representing the interests of more than 400,000 licensed radio amateurs in the U.S.) respectfully requests that the Commission grant special temporary authority to permit experimentation, as detailed below. This application is made on behalf of, and with the consent of, the individuals named herein. These individuals volunteered to be part of this STA, which was prepared without reference to whether or not these individuals are League members.

1. Names and Addresses of the Applicants

The names and addresses of the applicants are given in the attached letters of participation.

2. Description of Need

Special temporary authority is required to permit unattended automatic operation of amateur stations using packet radio below 50 MHz. Specific waiver of section 97.80 of the Commission's rules is needed to permit unattended operation under automatic control while transmitting third-party traffic on frequencies below 50 MHz.

3. Type of Operations

Operations will involve packet-switched transfer of messages between unattended amateur stations operating under automatic control on HF.

a. Purpose:

The amateur stations participating in the STA will function as relay stations in a long-haul HF net called SKIPNET which connects at the end points with the existing and rapidly growing VHF amateur packet-radio network. The VHF packet network is presently capable of only local and regional message forwarding up to about 150 miles reliably and up to about 300 miles at the extreme. SKIPNET will provide the long-distance links needed to effect an amateur packet-radio message-transfer capability throughout the United States, thus significantly enhancing the amateurs' emergency-communications capabilities.

b. Objectives:

The objectives of this request for STA are:

(1) to prove the concept of unattended automatic control of HF packet-radio stations;

(2) to demonstrate experimentally that such operation can be conducted without:

(a) harmful interference to other users;

(b) malfunction of transmitters such that they deny others the use of the operating frequency; and,

(c) transmission of improper communications without timely corrective action.

(3) to determine the design and responsible management of a nationwide network of stations conducting such operations.

(4) to gather information necessary to drafting of a petition for a permanent rule change to permit unattended automatic control of HF packet-radio stations.

4. Dates and Times of Operation

The applicants request that operation under the STA commence immediately upon the granting of authority by the Commission, and that such authority be permitted for six months. The operations are to be on a 24-hour basis during the STA period.

5. Class of Stations and Radio Service

All stations are licensed in the amateur service, and all hold a minimum of a General class license.

6. Location

Locations of the stations are given in the individual letters of participation, attached.

7. Number of Transmitters

No waiver of amateur rules is required.

8. Operating Frequencies

The operating frequencies are listed below. These listed frequencies designate the center frequencies of the channels. It is our intention that the frequencies listed will be used, but we wish to retain the flexibility of changing a few kHz in order to avoid interference. One or more of these frequencies will be in use at any one time, according to diurnal propagational needs.

3607.3 kHz
7091.3
10147.3*
14108.3

*Band edge of 10150 kHz to be respected at all times.

9. Output Power of Transmitters

The transmitter output power shall not exceed 200 watts.

10. Type of Emission

J2D and F1D emissions emissions are to be used.

11. Description of Antenna

A variety of antennas will be used. No special waiver of the rules is requested.

If you have any questions, please contact Mr. Perry F. Williams, telephone 202-296-9107, 202-296-9100 or 203-666-1541.

Sincerely,

David Sumner

David Sumner, K1ZZ
Executive Vice President

Attachments:

A. List of Stations
B. Individual Letters of Participation

STA STATION LIST

NAME	CALL	ADDRESS
Bennett, John A.	N4XI	5805 Whitethorne Drive Evansville IN 47710
Borden, David W.	K8MMO	10808 Mantilla Court Oakton VA 22124
Cheek, David H.	WA5MWD	1510 Travis Street Garland TX 75042
Clark, Thomas A.	W3IWI	6388 Guilford Road Clarksville MD 21029
Demers, Joseph P.	WA1WLV	378 Market Street Lawrence MA 01843
Dresser, Ken	KK4L	P.O. Box 114 Waxhaw NC 28173
Duncan, Richard C.	WD5B	2504 North Gathings Drive West Memphis AR 72301
Dusbabek, Lee	WB6KAJ	1823 Lotus Place Brea CA 92621
Eigenbrode, John J.	KD6SQ	10974 Modoc Street Alta Loma CA 91701
Ely, Dennis N.	W5XO	P.O. Box 418 Gause TX 77857
Estey, Carl A.	WA0CQG	276 Walnut Lane Apple Valley MN 55124
Fagan, Sr., Patrick J.	WA5DVV	Route 7 2412 East Birch Drive Gulfport MS 39503
Fahrner, Frederick S.	KB6TRS	5470 Ball Drive Soquel CA 95073
Fisher, Joseph A.	KC2TN	33 Oakwood Lane Atco NJ 8004
Fitz, David C.	KI0Q	1124 Roosevelt Avenue Ames IA 50010
Freeborn, David A.C.	KC0QJ	297 Vega Road Waldenburg CO 81089
Galipeau, Jr., Joseph E.	WA1LRL	11200 Young Drive Brighton MI 48116-9250
Garnier, David	WB9OWN	7803 West Elm Court Franklin WI 53132
Geng, Larl H.	N1DL	88 East Short Road Huntington Bay NY 11743
Harwood, Kenneth L.	WA5QZI	13907 Parksite Woods San Antonio TX 78249
Hearn, Jack A.	KH6WY	95-740 Kahikinui Place Mililani HI 96789
Hogan, Thomas J.	WB7DCH	26911 SE 456th Street Enumclaw WA 98022
Huf, Theodore A.	K4NTA	1829 NW Pinetree Way Stuart FL 33494
Lagermasini, Joseph P.	AG3F	206 Wilmot Drive Towanda PA 18848
Lee, Jr., C.A.	WA4EWV	6515 Glenhill Drive Spring TX 77389
Lengling, Gregg R.	WD9DHI	N60 W6667 Victoria Court Cedarburg WI 53012
Lichtenwalner, Byron D.	W1HAB	4525 Robinson Place Boulder CO 80301
Merten, Donald J.S.	K2AAA	Post Office Box 309 Montauk NY 11954
Michalson, William R.	AA2S	RFD 1, Box 281 Southbridge MA 01530
Mitchell, Gary A.	WB9TPG	200 East Eagle Street Versailles KY 40383
Morris, Wesley F.	K7PYK	7422 East McKinley Street Scottsdale AZ 85257
O'Neil, Donald W.	WA4SZK	900 Beverly Drive Florence SC 29501
Oredson, Henry N.	W0RLI	134 Ponderosa Drive Santa Cruz CA 95060
Patterson, Regg K.	KR5S	115 Cochise Drive Sedona AZ 86336
Salls, Herbert H.	WB1DSW	122 Giles Road, RFD #1 East Kingston NH 03827
Scalf, James E.	K4TKU	10445 SW 70th Avenue Miami FL 33156
Scalf, Jr., Fred R.	K4EID	4813 Palmstone Lane Knoxville TN 37918
Schiers, Jr., Robert A.	N0AN	Box 171 Ames IA 50010
Schimmel, Joseph	W2HPM	41 Midvale Avenue Farmingville NY 11738
Schroeder, William A.	W9ZBD	4247 Forest Point Drive Rhinelander WI 54501
Shavey, Dave L.	K0HOA	4745 Nightingale Drive Colorado Springs CO 80907
Simon, Donald	W6CUS	2327 Alva Avenue El Cerrito CA 94530
Smith, John T.	KI4XO	2449 Old Forge Court Marietta GA 30062
Stiver, Donald R.	N6EEG	Lawrence Berkeley Lab 1 Cyclotron Road B-88 Berkeley CA 94720
Subich, Joseph T.	AD8I	7825 Star Route 188 Circleville OH 43113
Thanisch, Robert	KN5D	P.O. Box 997 Corrales NM 87048
Vester, John D.	KE7CZ	Route 61, Box 1764 Dewey AZ 86327
Wade, David N.	KC7CG	7461 East Lakeside Drive Tucson AZ 85730
Walker, Charles P.	NA2B	Route 1, Box 176 Townline Road Messena NY 13662
Wood, Jr., Neal S.	K0KBY	4775 Pine Drive Miami FL 33143
Zeph, David L.	W9ZRX	16310 Spring Mill Road Westfield IN 46074

AMATEUR RADIO
NEWS RELEASE
THE AMERICAN RADIO RELAY LEAGUE, INC. ■ 225 MAIN STREET, NEWINGTON, CT 06111

7th Annual ARRL Network Conference

The 7th Annual ARRL Networking Conference will be held on Saturday, October First at the Johns Hopkins University Applied Physics Laboratory (APL) Kossiakoff Center. The APL facility is located between Laurel and Columbia, MD, midway between Washington and Baltimore.

The networking conference will bring together the developers of hardware and software for amateur computer networks and the users. In the past the conference has been the forum for the announcement of many exciting new developments and the published conference proceedings have become valuable reference documents. This year it is anticipated that contributions will include information on new networking software, new modem technology, digital signal processing and the new series of PACSAT satellites which AMSAT-NA plans to launch beginning in early 1989. Prospective contributors should obtain an author's kit direct from ARRL (Attn: Maty Weinberg, 225 Main Street, Newington, CT 06111). The deadline for the submission of camera-ready manuscripts is **August 25th.**

If you plan to attend the conference, we ask that you register early. A registration fee of $20 will provide a copy of the conference proceedings, buffet luncheon and defray the costs of putting on the meeting. If your registration is received after September 25, the fee will be $30. Your registration should be sent directly to:

Don Bennett, K4NGC
P.O. Box 1944
Woodbridge, VA 22193

and make your checks payable to Don Bennett. Registrants will be sent a list of suggested hotels/motels in the area, maps, etc.

Sponsors of the conference include the ARRL, APL ARC, AMSAT, TAPR, AMRAD and VPRA.

73 for the local organizing group de W3IWI